



UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

DIVISION OF
CORPORATION FINANCE

January 25, 2011

Gajus V. Worthington
President and Chief Executive Officer
Fluidigm Corporation
7000 Shoreline Court, Suite 100
South San Francisco, California 94080

**Re: Fluidigm Corporation
Registration Statement on Form S-1
Amended January 7, 2011 and January 18, 2011
File No. 333-170965**

Dear Mr. Worthington:

We have reviewed your filing and have the following comments. In some of our comments, we may ask you to provide us with information so we may better understand your disclosure.

Please respond to this letter by amending your registration statement and providing the requested information. Where you do not believe our comments apply to your facts and circumstances or do not believe an amendment is appropriate, please tell us why in your response.

After reviewing any amendment to your registration statement and the information you provide in response to these comments, we may have additional comments.

Artwork

1. Please note that you may include text in your artwork only to the extent necessary to explain briefly the visuals in the presentation. Text such as "Nano-volume Fluid Handling," "Massively Parallel," and "Integration" in the inside front cover artwork appears unnecessary in explaining the visuals in your presentation. Please revise accordingly.

The Fluidigm Solution, page 3

2. Please revise here or in an appropriate section of your document to disclose the substance of your response to prior comment 4 regarding your current and anticipated continued focus of your research and development efforts on the molecular diagnostic market.

The Offering, page 7

3. We note you intend to use a portion of the offering proceeds to repay a portion of the notes issued in January 2011. Please revise to quantify the portion of the offering proceeds to be used to repay notes held by affiliates. In this regard, we note your disclosure on page 119.
4. Please reconcile your disclosure on page 7 that the conversion of all currently outstanding shares of convertible preferred stock would result in the issuance of 20,784,926 shares of common stock with the 19,860,495 figure disclosed on page 128.

Capitalization, page 34

5. Please explain your basis for the assumed net exercise of your Series E-1 preferred stock warrants issued January 6, 2011. Please clarify whether there are any contractual agreements for the exercise of these warrants. In addition, since there are several pro forma adjustments please revise to separately disclose each of the pro forma adjustments.

Non-invasive Prenatal Diagnostics Collaboration, page 79

6. We refer to sections 3.1(c) and 9.1 of exhibit 10.21. Please revise to disclose the term of the agreement, including the anticipated duration of each phase of the agreement. Please also revise to disclose the milestone payment amounts set forth in section 6.1(a) of exhibit 10.21 as well as the payment amounts in sections 4.1 and 4.2 of exhibit 10.22.

Property and Environmental Matters, page 88

7. We refer to your disclosure on page 33 concerning the intended use of proceeds for expansion of facilities and manufacturing operations. Please revise to discuss the adequacy of your existing facilities and manufacturing operations and your current plans for expansion. Please refer to Instruction 1 to Item 102 of Regulation S-K.

Registration Rights, page 129

8. We note your disclosure that the aggregate common shares to which registration rights apply includes shares of common stock issued on conversion of outstanding preferred stock; however, the aggregate number of registration rights shares is less than the number of shares of common stock issued on conversion of preferred stock. Please advise or revise.

Note 3. License Agreement, page F-19

9. With see your response to prior comment 27. Please clarify how you determined the \$1,676,000 fair value of the sub-licensee's preferred stock received for the sale of the

sub-license, whether this was based on third party sales of similar preferred stock, an independent valuation, or other valuation methodologies. If your valuation is based on third party sales please explain to us why you believe that there were sufficient sales to establish a fair value of this preferred stock. Please also tell us about the sub-licensee and whether this is a public or private company.

Note 10. Stock-Based Compensation, page F-29

10. We reference your response to prior comment 33. Please clarify the specific nature of the two discounts, “discount rate” and “discount for lack of marketability,” the basis for each discount and how the amount of any discount was determined. Please explain the reason you continued to use significant discounts for options granted in January 2011 after the registration statement was filed and after you received an estimated price range from your underwriters. In addition, clarify your reference to the months to the liquidity event of 12 and how this was considered in your December 15, 2010 valuation. We note the discussion in your response that your valuation assumes a successful IPO scenario and the estimated price range from your underwriters assumes an offering in the first quarter 2011.
11. Please explain to us why your estimated fair value per common share of \$4.84 at January 4, 2011 is significantly lower than the valuation from the underwriters of \$6.75 to \$8.75 received on January 5, 2011. We note that the estimated price range from your underwriters assumes an offering in the first quarter 2011. In addition, tell us how you considered the preferred stock issuances in your estimate of the fair value of your common stock since these are converted to common on a one-to-one basis. Please also explain to us how you considered the decrease in the conversion price of the Series E preferred stock from \$14 per share to \$10.77 in January 2011 in the valuation of your common stock.

Interim Note 12. Subsequent Events, page F-50

12. Please revise to clarify your accounting treatment for the reduction in the conversion price of the Series E convertible preferred stock from \$14 per share to \$10.77 per share.

Exhibits, page II-4

13. Please file the bank line of credit agreement that you reference on page F-50 or explain why you believe that it is not required to be filed pursuant to Item 601(b)(10) of Regulation S-K.

We urge all persons who are responsible for the accuracy and adequacy of the disclosure in the filing to be certain that the filing includes the information the Securities Act of 1933 and all applicable Securities Act rules require. Since the company and its management are in possession of all facts relating to a company's disclosure, they are responsible for the accuracy and adequacy of the disclosures they have made.

Notwithstanding our comments, in the event you request acceleration of the effective date of the pending registration statement please provide a written statement from the company acknowledging that:

- should the Commission or the staff, acting pursuant to delegated authority, declare the filing effective, it does not foreclose the Commission from taking any action with respect to the filing;
- the action of the Commission or the staff, acting pursuant to delegated authority, in declaring the filing effective, does not relieve the company from its full responsibility for the adequacy and accuracy of the disclosure in the filing; and
- the company may not assert staff comments and the declaration of effectiveness as a defense in any proceeding initiated by the Commission or any person under the federal securities laws of the United States.

Please refer to Rules 460 and 461 regarding requests for acceleration. We will consider a written request for acceleration of the effective date of the registration statement as confirmation of the fact that those requesting acceleration are aware of their respective responsibilities under the Securities Act of 1933 and the Securities Exchange Act of 1934 as they relate to the proposed public offering of the securities specified in the above registration statement. Please allow adequate time for us to review any amendment prior to the requested effective date of the registration statement.

You may contact Jeanne Bennett at 202-551-3606 or Brian Cascio, Accounting Branch Chief, at 202-551-3676 if you have questions regarding comments on the financial statements and related matters. Please contact Joseph McCann at 202-551-6262 or Mary Beth Breslin, Senior Attorney, at 202-551-3625 with any other questions.

Sincerely,

Amanda Ravitz
Assistant Director

cc (via fax): David J. Segre, Esq. – Wilson Sonsini Goodrich & Rosati P.C.